IS 3156-2 (1992): Voltage transformers, Part 2: Measuring voltage transformers [ETD 34: Instrument Transformers]

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भारतीय मानक

वोल्टता ट्रांसफार्मरों की विशिष्टि

भाग 2 वोल्टता ट्रांसफार्मरों का मापन

(दूसरा पुनरीक्षण)

Indian Standard

VOLTAGE TRANSFORMERS — SPECIFICATION

PART 2 MEASURING VOLTAGE TRANSFORMERS

(Second Revision)

Second Reprint AUGUST 1997

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

November 1992

Price Group 1

FOREWORD

This Indian Standard (Part 2) was adopted by the Bureau of Indian Standards, after the draft finalized by the Instrument Transformers Sectional Committee had been approved by the Electrotechnical Division Council.

This standard was first published in 1965 and was subsequently revised in 1978. Second revision of this standard has been undertaken to bring it in line with the latest developments at International level.

Indian Standards on voltage transformers have been published in four parts:

Part 1 General requirements,

Part 2 Measuring voltage transformers,

Part 3 Protective voltage transformers, and

Part 4 Capacitor voltage transformers.

In the preparation of this revision assistance has been derived from the following:

IEC Pub 186 (1987) Voltage transformers with Amendment No. 1, December 1988; published by the International Electrotechnical Commission.

BS 3941 : 1975 Voltage transformers with latest amendments, published by the British Standards Institution.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

VOLTAGE TRANSFORMERS — SPECIFICATION

PART 2 MEASURING VOLTAGE TRANSFORMERS

(Second Revision)

1 SCOPE

1.1 This standard (Part 2), covers additional requirements for measuring voltage transformers.

2 TERMINOLOGY

2.1 For the purpose of this standard the definitions given in Part 1 of this standard shall apply.

3 GENERAL REQUIREMENTS

3.1 The measuring voltage transformers shall comply with the requirements specified in this standard; in addition to those specified in Part 1 of this standard.

4 ACCURACY CLASS

4.1 Accuracy Class Designation

For measuring voltage transformers, the accuracy class is designated by the highest permissible percentage voltage error at rated voltage and with rated burden prescribed for the accuracy class concerned.

4.2 Standard Accuracy Classes

The standard accuracy classes for measuring voltage transformers shall be 0·1, 0·2, 0·5, 1·0 and 3.

5 LIMITS OF VOLTAGE ERROR AND PHASE DISPLACEMENT

5.1 The voltage error and phase displacement at rated frequency shall not exceed the value given in Table 1 at any voltage between 80 percent and 120 percent of rated voltage and with burden of between 25 percent and 100 percent of rated burden, at a power factor of 0·8 lagging.

5.2 The errors shall be determined at the terminals of the transformers and shall include the effects of any fuse or resistors supplied as an integral part of the transformers.

Table 1 Limits of Voltage Errors and Phase Displacement

(*Clause* 5.1)

Class	Percentage Voltage (Ratio) Error	Phase Displacement (Minutes)
(1)	(2)	(3)
0·1	± 0·1	± 5
0·2	± 0·2	± 10
0·5	± 0·5	± 20
1·0	± 1·0	± 40
3	± 3·0	—

6 DUAL PURPOSE VOLTAGE TRANSFORMER

6.1 Where the voltage transformer has one secondary winding and is intended to serve a dual purpose, that is, both for measurement as well as protection, it shall comply with the requirements of both Part 2 and Part 3 of this standard.

6.2 Where the voltage transformers have two secondary windings, one for measurement and the other for protection, having the same or different transformation ratios, they shall respectively comply with Part 2 and Part 3 of this standard.

6.2.1 For transformers having two or more separate secondary windings (other than residual voltage windings), because of their interdependance the user should specify for each winding the simultaneous output ranges of the other windings at which it must fulfil the requirements of its designated accuracy class. Each winding should fulfil its respective accuracy requirement within its output range whilst at the same time the other winding has an output of any value from zero to 100 percent of the output range specified for the other winding.

6.2.2 If the user has not specified as required in **6.2.1**, then each winding shall fulfil the requirements of its designated accuracy class with the other windings (other than residual voltage windings) simultaneously having any output between 25 percent and 100 percent of their respective rated outputs.

6.2.3 In proving compliance with **6.2.1** or **6.2.2** it shall be sufficient to test at extreme values only.

6.2.4 If one of the windings is loaded only occasionally for short periods or if it is intended as a residual voltage winding, its effect on the other winding(s) shall be neglected and excluded from the requirements of **6.2.1** or **6.2.2**.

7 MARKING

7.1 All the relevant particulars shall be marked in accordance with **8** of Part 1 of this standard. In case of voltage transformers required to meet combinations of output and accuracy classes, the necessary information should also be provided.

8 TESTS

8.0 The following tests shall be carried out in addition to the tests given in Part 1 of this standard.

8.1 Type Tests

8.1.1 *Accuracy Test*

To prove compliance of the measuring voltage transformer with **5**, the tests shall be made at 80 percent, 100 percent and 120 percent of rated voltage at rated frequency and at 25 percent and 100 percent of rated burden.

8.1.1.1 Three-phase measuring voltage transformers shall be tested in accordance with **8.1.1**, and the limits specified in **5** shall apply to the corresponding line-to-line voltages of the primary and secondary windings (AB-ab, BC-bc and AC-ac). In carrying out the test, the primary shall be energised by a three phase voltage and a three-phase burden of appropriate value shall be connected to the secondary terminals.

8.2 Routine Tests

8.2.1 *Accuracy Test*

The routine tests for accuracy are in principle the same as the type tests in **8.1.1**, but routine tests may be carried out at rated voltage and at 25 percent and 100 percent of rated burden at power factor of 0·8 lagging.

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BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 323 01 31, 323 33 75, 323 94 02

Telegrams: Manaksanstha
(Common to all offices)

Regional Offices:

Telephone

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg
NEW DELHI 110002 — 323 76 17, 323 38 41

Eastern : 1/14 C.I.T. Scheme VII M, V.I.P. Road, Maniktola
CALCUTTA 700054 — 337 84 99, 337 85 61
337 86 26, 337 91 20

Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022 — 60 38 43
60 20 25

Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113 — 235 02 16, 235 04 42
235 15 19, 235 23 15

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)
MUMBAI 400093 — 832 92 95, 832 78 58
832 78 91, 832 78 92

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